

## **PATENT ABSTRACTS OF JAPAN**

(11)Publication number : **11-290279**

(43)Date of publication of application : **26.10.1999**

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(51)Int.Cl.

**A61B 5/00**

**A61B 6/00**

**A61B 6/03**

**G06F 17/30**

**G06F 19/00**

**G06T 1/00**

**G09G 5/00**

**H04N 5/265**

**H04N 5/91**

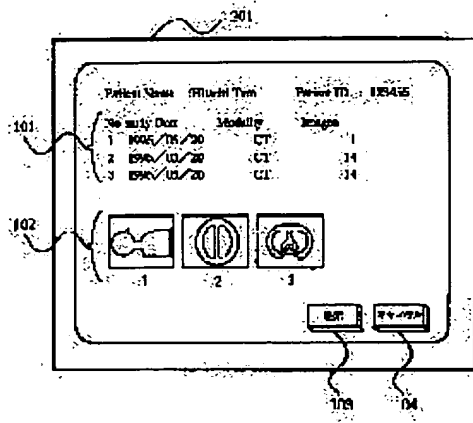
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(54) **MEDICAL IMAGE DISPLAY DEVICE**



(57)Abstract:

PROBLEM TO BE SOLVED: To provide a medical image display device which facilitates the capturing of features of serial images.

SOLUTION: A list 101 of character information of each of serial images is displayed at the center of a selected screen where the serial images are selected pertaining to a certain patient. A list 102 of representative images with a higher possibility of indicating features of each of the serial images or referring thereto below the list 101 of the character information. The use of the representative images enables easier capturing of the features of each of serial images.

## LEGAL STATUS

[Date of request for examination]

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's decision of rejection]

[Date of requesting appeal against examiner's decision of rejection]

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## CLAIMS

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[Claim(s)]

[Claim 1] In the medical image display device which will display a series of this chosen images if a series of images to display among two or more of a series of images are chosen A representation image display means to display at least one representation image which represents said two or more of a series of images, respectively, The medical image display device characterized by having a selection means to choose a series of images to display with reference to at least one representation image displayed by said representation image display means.

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## DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to a medical image display device, especially is applied to medical image diagnostic equipment, chooses a series of images which operators, such as a medical practitioner and a radiological technologist, want to display with reference to a selection screen, and relates to the medical image display device which displays a series of selected images on monitor display.

[0002]

[Description of the Prior Art] The image photoed by X-ray inspection equipment, a CT scanner, etc. in the hospital is sent to image observation equipment, and is recorded on recording devices, such as a magnetic disk. When an operator chooses, the recorded image is read from a recording device and displayed on monitor display.

[0003] In case a series of images photoed in one photography procedure are displayed, one is chosen from two or more of a series of images on the selection screen displayed on said monitor display. As shown in drawing 14, the list 101 of text, such as a date which the image of one ream each photoed, and the photography approach, was displayed on this selection screen, and the operator had chosen as it a series of images which you want to display based on such information.

[0004]

[Problem(s) to be Solved by the Invention] However, sufficient information on the image of one ream each was not acquired only from said text, but there was a fault of being hard to catch the description. This invention was made in view of such a situation, and aims at offering the medical image display device which can catch the description of the image of one ream each easily.

[0005]

[Means for Solving the Problem] In the medical image display device which will display a series of this chosen images if this invention chooses a series of images to display among two or more of a series of images in order to attain the above-mentioned purpose It is characterized by having a selection means to choose a series of images to display with reference to at least one representation image displayed by representation image display means to display at least one representation image which represents said two or more of a series of images, respectively, and said representation image display means.

[0006] Moreover, it is characterized by having a means to memorize the representation image chosen with said selection means.

[0007] According to this invention, at least one representation image which represents two or more of a series of images, respectively is displayed by the representation image display means. If a series of images to display are chosen with a selection means with reference to said at least one displayed representation image, a series of images chosen by said selection means will be displayed. Thus, the description of the image of one ream each can be easily caught by displaying the representation image of the image of one ream each on a selection screen.

[0008] Moreover, actuation of catching the description of the image of one ream each

further can carry out now easily for an operator by reading the representation image memorized from said storage means.

[0009]

[Embodiment of the Invention] It explains in full detail about the gestalt of desirable operation of the medical image display device applied to this invention according to an accompanying drawing below. Drawing 1 is the screen block diagram of the selection screen which chooses a single string image about a certain patient. It is displayed on a display 201 and this selection screen is PatientName (name of patient) and Patient in the upper part of a selection screen. ID (patient ID) is displayed and the list 101 of the text of one ream each image is displayed on middle of the screen. This list 101 is Study of one ream each image. It consists of Date (photography day), Modality (the photography approach), and Images (the number of images). For example, Study of a single string image of No.1 Date is on May 20, 1996, Modality is CT and Images is 1. However, the contents displayed on said list 101 are not limited to the above-mentioned thing.

[0010] In this invention, the list 102 of the high representation image of possibility of wanting to express or refer to the description of one ream each image caudad of the lists 101 of said text is displayed, and the description of one ream each image can be easily caught with these representation images.

[0011] If a single string image to click and display said text or each representation image with coordinate designating devices, such as a mouse, is chosen and the display carbon button 103 is clicked, a selected single string image will be displayed. When not displaying a selected single string image, Cancel button 104 is clicked and selection of this single string image is canceled.

[0012] For example, first, if a single string image of No.3 is chosen and displayed, as shown in drawing 2 , the representation image 301 of a selected single string image will be displayed. Under this representation image 301, the image [ degree ] carbon button 303, the front image carbon button 302, and the termination carbon button 304 are displayed, if the image [ degree ] carbon button 303 is clicked, the next image of the image with which a single string image is displayed will be displayed, and if the front image carbon button 302 is clicked, a front image will be displayed. A click of the termination carbon button 304 ends the display of this single string image. In addition, the image displayed first may not be limited to the representation image 301, but any image of a selected single string image is sufficient as it.

[0013] Moreover, the number of images displayed on one screen may not be limited to one, but plural is sufficient as it. For example, as shown in drawing 3 </A>, six images 401-406 may be displayed on CRT among a series of images. The top image 401 is a

representation image among the displayed images 401-406. Moreover, as are shown in drawing 4 , and it is good also as a representation image and the image 403 in front of [ of a center ] one is shown in drawing 5 among the displayed images 401-406, it is good also considering the image 403 after [ of a center ] one as a representation image among the displayed images 401-406. Furthermore, as shown in drawing 6 , nine images 501-509 are displayed on CRT among a series of images, and it is good also considering a central image as a representation image. Thus, a representation image can be quickly referred to by setting up the number of images displayed on one screen, and the location of a representation image according to liking.

[0014] Drawing 7 is the block diagram showing the hardware configuration of a medical image display device. As shown in this drawing, this medical image display device consists of system buses 207 which mainly connect each of these components with the coordinate designating devices 47, such as the indicating equipments 201, such as CRT, the manual input 46 of the keyboard for inputting a menu selection command etc., and a mouse for inputting various kinds of operator command and location commands, MPU204, memory 205, and the external storage 206, such as a magnetic disk.

[0015] MPU204 controls the whole by making the contents of memory 205 into a working area. Various data, such as image data, are stored, and while an image is displayed, various text, the menu information called an icon are shown to the display 201 by external storage 206.

[0016] Drawing 8 is the screen block diagram of CRT201 of interpretation-of-radiogram report creation time. The image 801 and the creation screen 802 of an interpretation-of-radiogram report which carry out the interpretation of radiogram are displayed on CRT201, and an interpretation-of-radiogram report is created by the interpretation-of-radiogram report writing screen 802.

[0017] Down the interpretation-of-radiogram report writing screen 802, the termination carbon button 803 and Cancel button 804 are displayed, if the termination carbon button 803 is clicked with a mouse 201, creation of an interpretation-of-radiogram report will be ended, and if Cancel button 804 is clicked, creation of an interpretation-of-radiogram report will be stopped.

[0018] Drawing 9 is a flow chart which shows the procedure of interpretation-of-radiogram report creation time. First, in MPU204, when an operator creates a report on the creation screen 802 of an interpretation-of-radiogram report, interpretation-of-radiogram report writing processing is performed (step 901).

[0019] If it judges whether the termination carbon button 803 or Cancel button 804 was

chosen by the coordinate designating device 203 (step 902) and judges that the termination carbon button 803 was chosen at step 902, it will register with external storage 206 by using the image 801 on display as a representation image (step 903). If the image 801 on display is registered, the created interpretation-of-radiogram report will be registered into external storage 206, and it will end (step 904).

[0020] On the other hand, if it judges that Cancel button 804 was chosen at step 902, report writing will be stopped and it will end, without saving a work content. In addition, although the image 801 currently displayed on interpretation-of-radiogram report creation time is registered as a representation image with the gestalt of this operation, the image which shows not only an interpretation-of-radiogram report but processing of arbitration at the time of activation may be registered as a representation image, and an operator may be made to choose from some images currently displayed, and you may register as a representation image.

[0021] As an example, how to register a representation image at the time of ROI (area of interest) setting activation is explained. Drawing 10 is the screen block diagram of CRT201 at the time of an ROI setup. As shown in this drawing, the ROI setting image 1001 and a mouse pointer 1002 are displayed on CRT201, and the termination carbon button 1003 and Cancel button 1004 are displayed under the ROI setting image 1001.

[0022] Drawing 11 is a flow chart which shows the procedure at the time of an ROI setup of a medical image display device. First, an operator performs ROI setting processing by MPU204 by moving a mouse pointer 1002 on the ROI setting image 1001, as shown in drawing 11 (step 1201).

[0023] If it judges whether the termination carbon button 1003 and Cancel button 1004 were clicked (step 1202) and judges that the termination carbon button 1003 was clicked, it will register with external storage 206 by using the image 1001 on display as a representation image (step 1203). Then, set-up ROI is also registered into external storage 206, and is ended (step 1204).

[0024] On the other hand, if it judges that Cancel button 1004 was clicked, ROI setting processing will be stopped and it will end, without saving a work content.

[0025] In addition, although an image and various preservation data were registered into the external storage 206 shown in drawing 2, as shown in drawing 13, they may form image preservation equipment separately, and may connect image observation equipment, image preservation equipment, and image diagnostic equipment in a network. Image observation equipment performs selection of a single string image or a representation image, display, interpretation-of-radiogram report writing actuation, area-of-interest (ROI) setting actuation, etc., and the retrieval information on an image

and an image, the setting information on a representation image, an interpretation-of-radiogram report, area-of-interest setting information, etc. are saved to image preservation equipment. Moreover, the combination of the equipment of arbitration may perform same actuation and informational storage.

[0026] Original image data is operated on a curtailed schedule, and the representation image displayed on the selection screen shown in drawing 1 is created, and is memorized to the field for the selection screen display of external storage 206 at the same time it stores a series of images in external storage 206. Moreover, although the selection screen shown in drawing 1 was displayed for every patient, it is not limited to this but the selection screen about two or more patients may be displayed.

[0027] Furthermore, although the selection screen was displayed on the display 201 which displays a series of images in drawing 1, it is not limited to this but a selection screen may be displayed on display with an another display 201. Moreover, although the list 101 of text and the list 102 of a representation image are displayed on coincidence, only the list 102 of a representation image may be expressed as the selection screen shown in drawing 1.

[0028]

[Effect of the Invention] As explained above, according to this invention, the description of the image of one ream each can be easily caught by displaying the representation image representing said image of one ream each of two or more of a series of images on a selection screen.

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DESCRIPTION OF DRAWINGS

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[Brief Description of the Drawings]

[Drawing 1] The screen block diagram of the selection screen which chooses a single string image about a certain patient.

[Drawing 2] The screen block diagram of CRT with which one image in a series of images was displayed.

[Drawing 3] The screen block diagram of CRT with which six images in a series of images were displayed.

[Drawing 4] The screen block diagram of CRT with which six images in a series of images were displayed.

[Drawing 5] The screen block diagram of CRT with which six images in a series of images were displayed.

[Drawing 6] The screen block diagram of CRT with which nine images in a series of images were displayed.

[Drawing 7] The block diagram showing the hardware configuration of a medical image display device.

[Drawing 8] The screen block diagram of CRT of interpretation-of-radiogram report creation time.

[Drawing 9] The flow chart which shows the procedure of the interpretation-of-radiogram report creation time of an image display device.

[Drawing 10] The screen block diagram of CRT at the time of area-of-interest (ROI) setting initiation.

[Drawing 11] The flow chart which shows the procedure at the time of an area-of-interest (ROI) setup of an image display device.

[Drawing 12] The screen block diagram of CRT under area-of-interest (ROI) setup.

[Drawing 13] The block diagram of the medical image display device which formed image preservation equipment separately from image observation equipment.

[Drawing 14] The screen block diagram of CRT of the conventional image display device.

[Description of Notations]

101 List of Text

102 List of Representation Image

103 Display Carbon Button

201 Display

202 Manual Input

203 Coordinate Designating Device

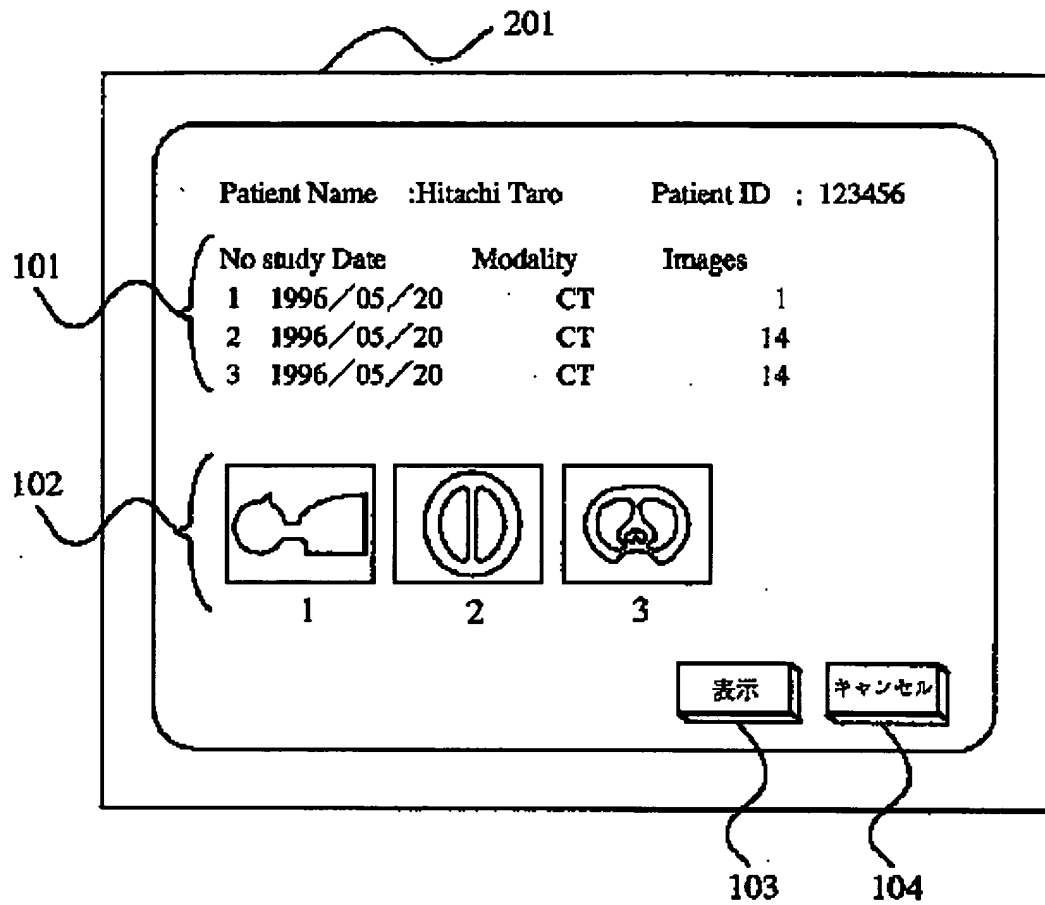
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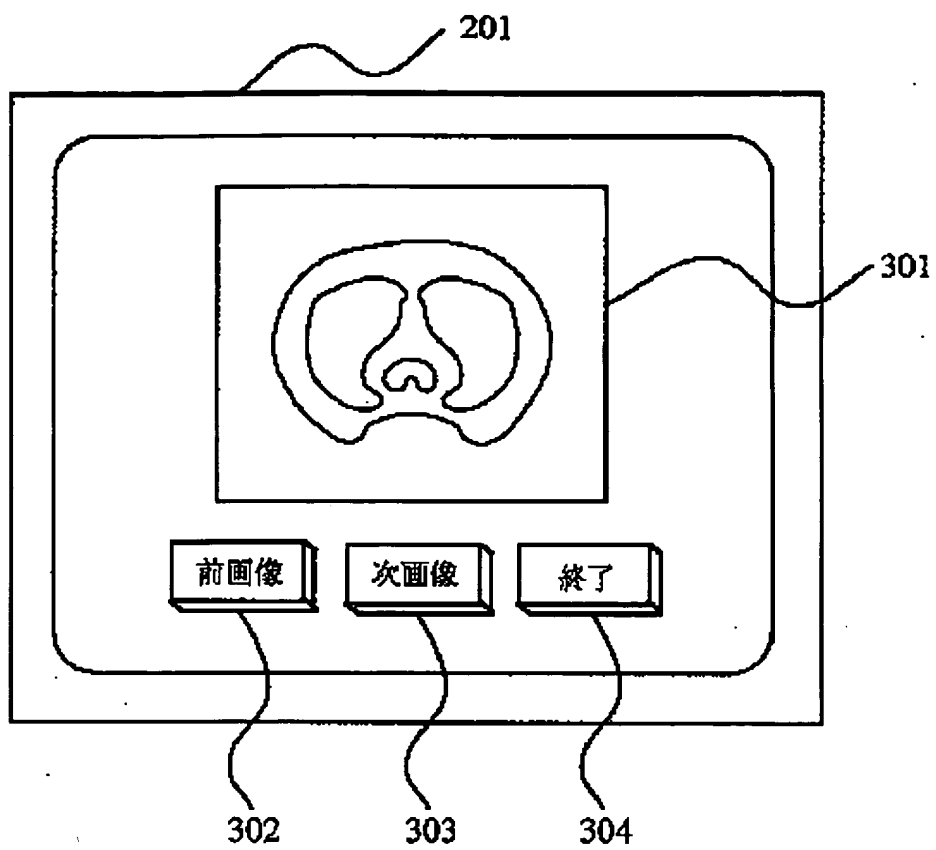
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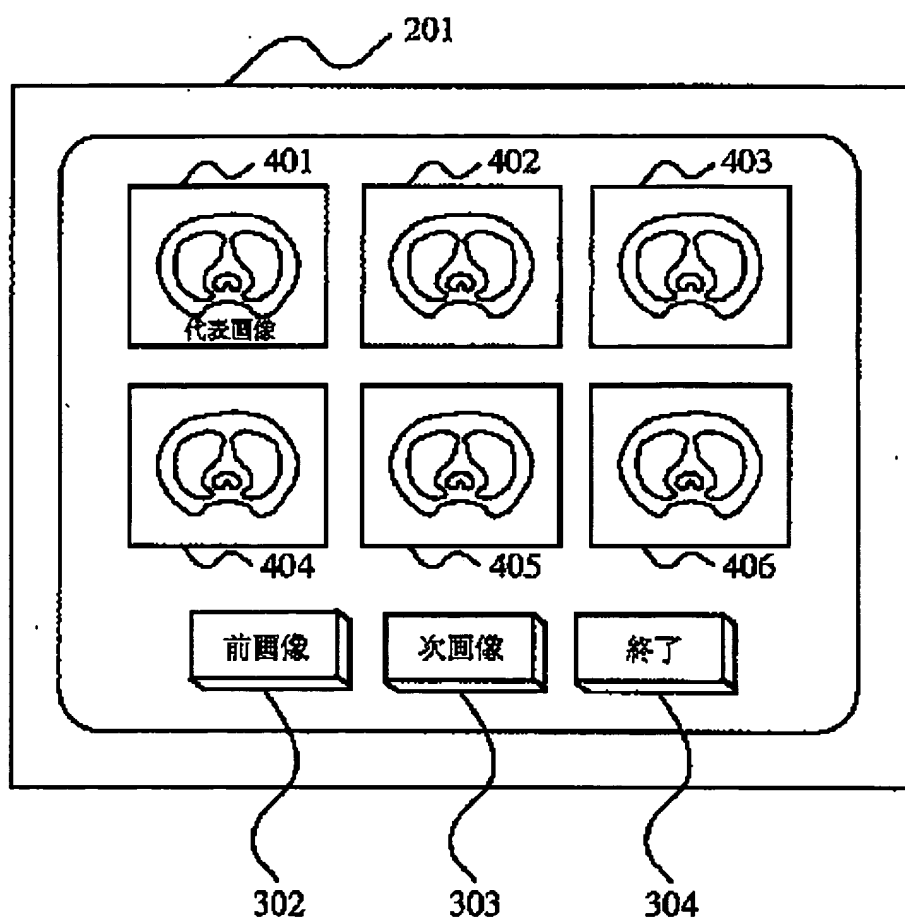
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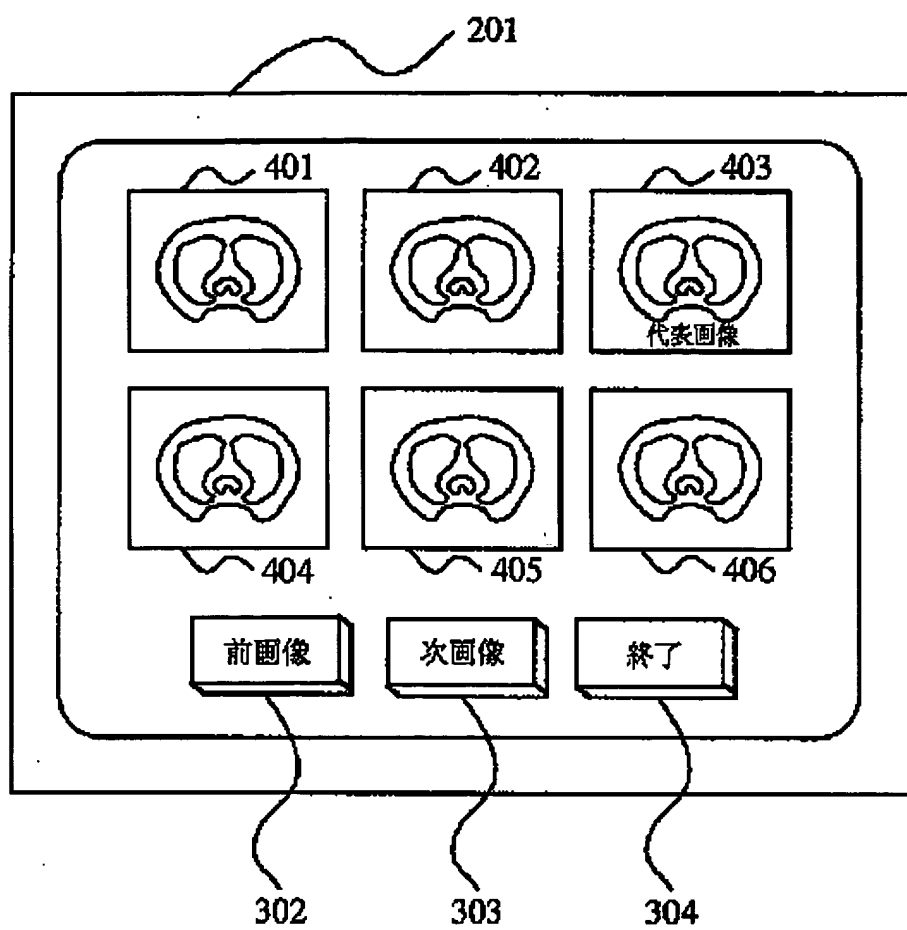
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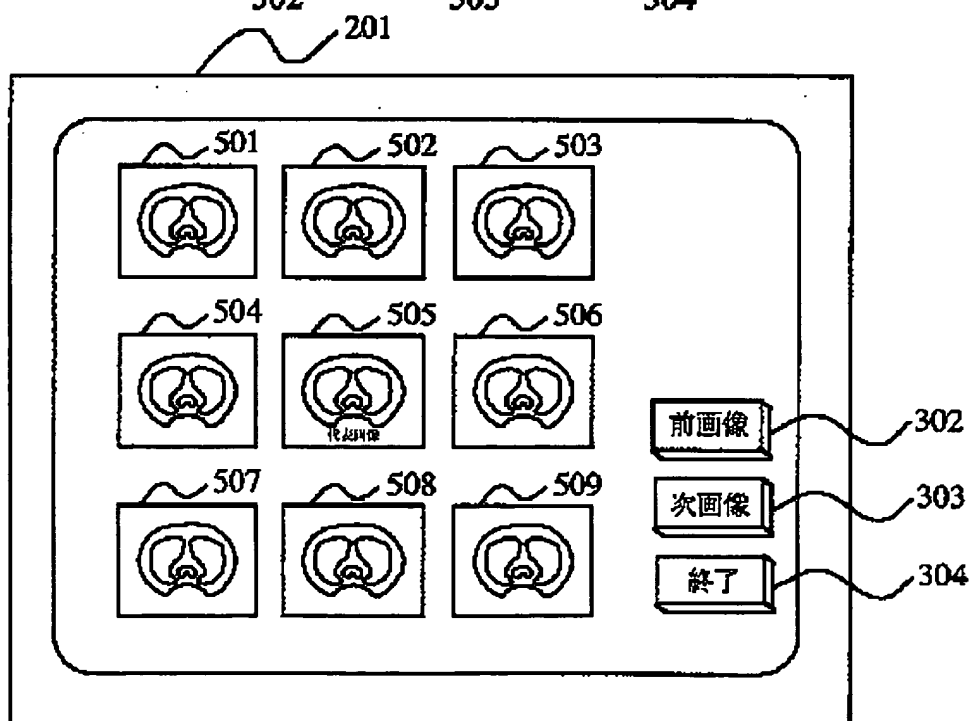
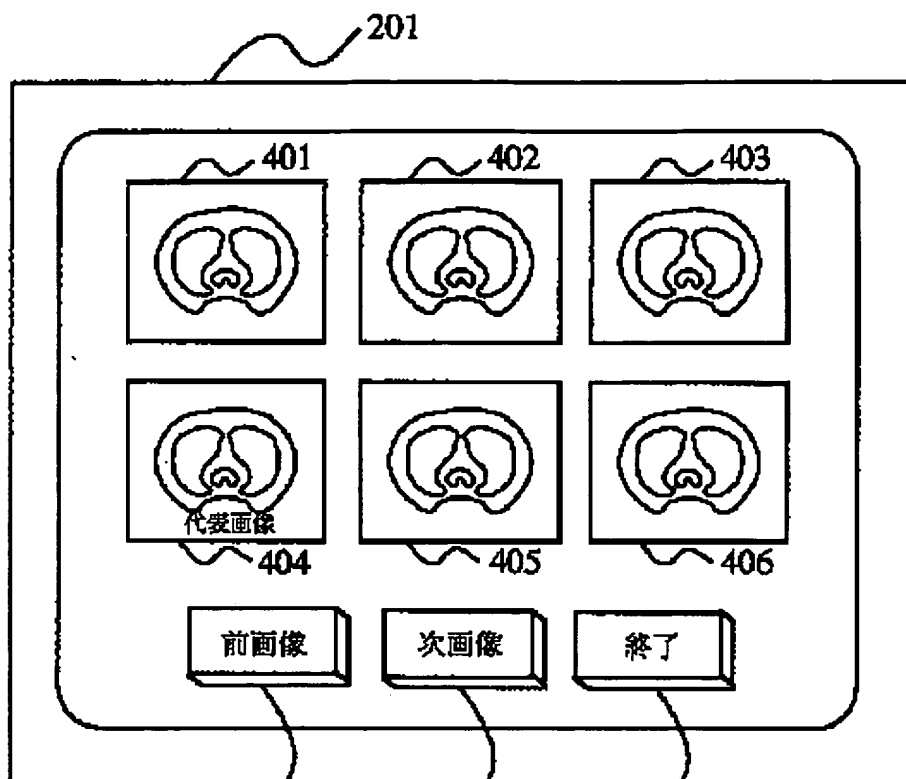
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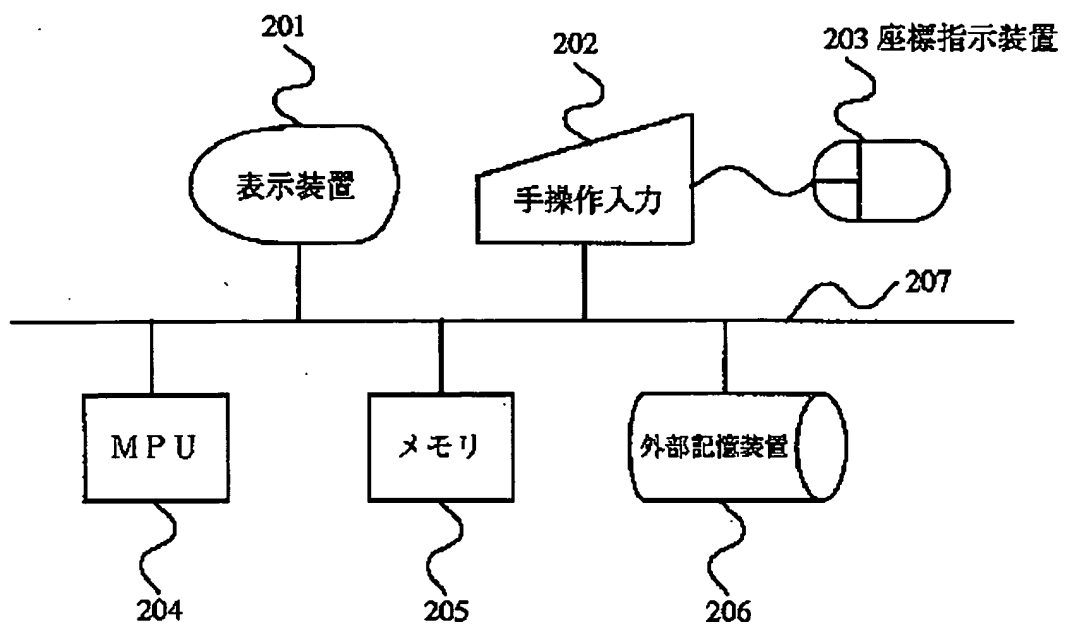


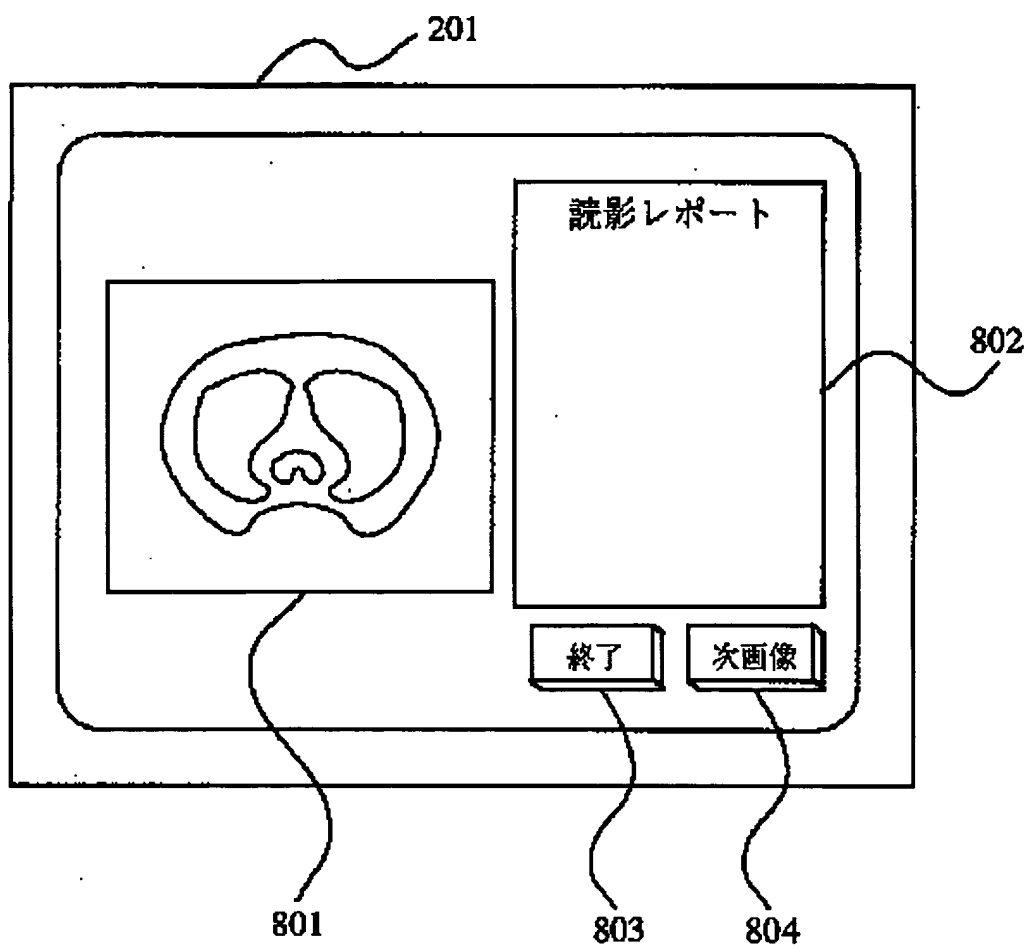




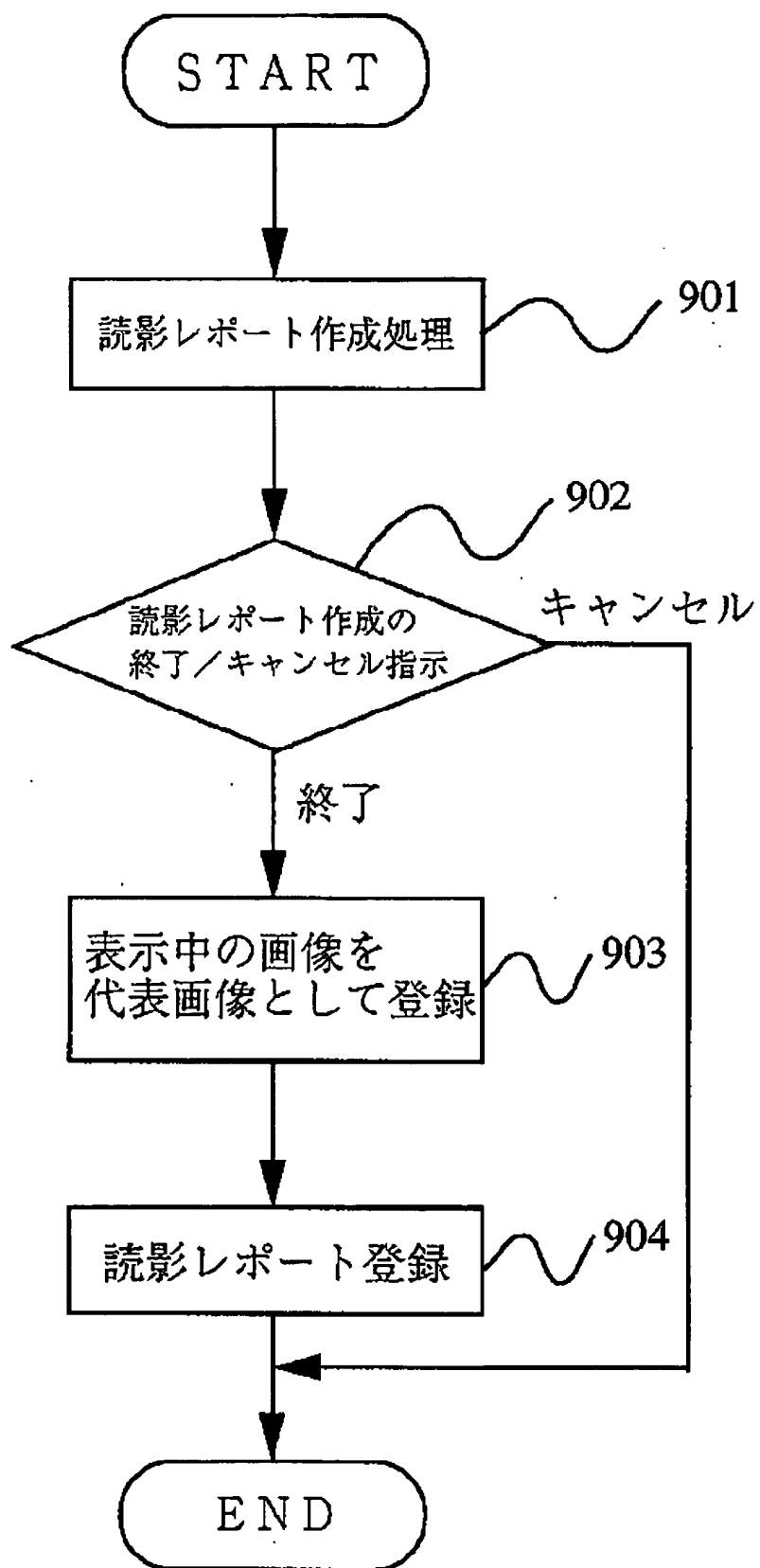


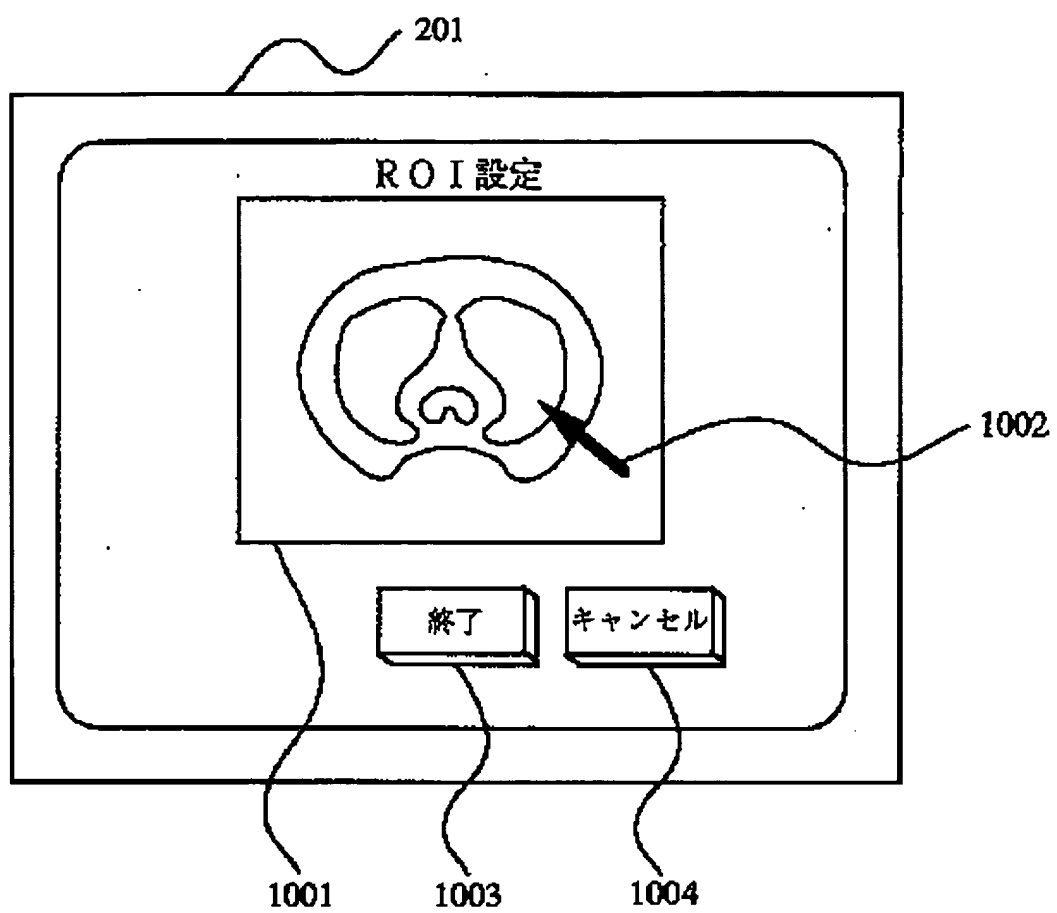


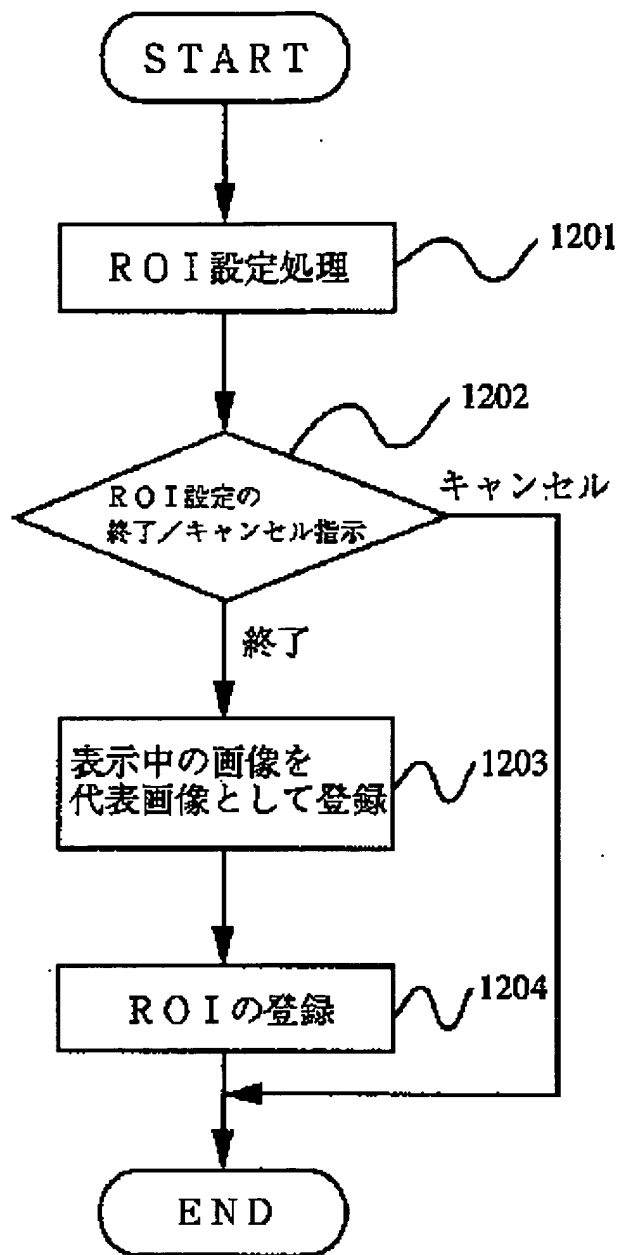


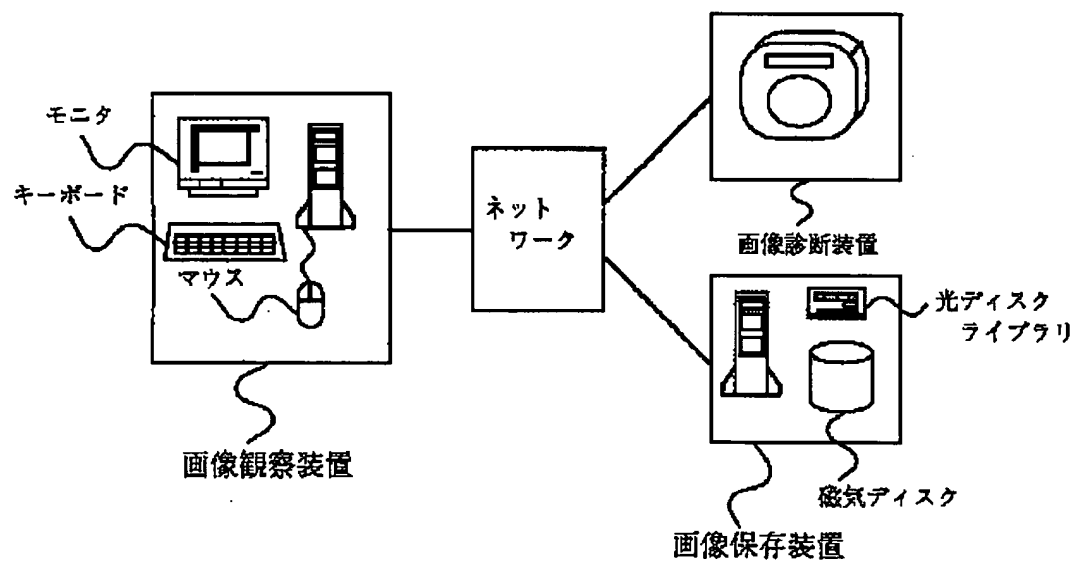
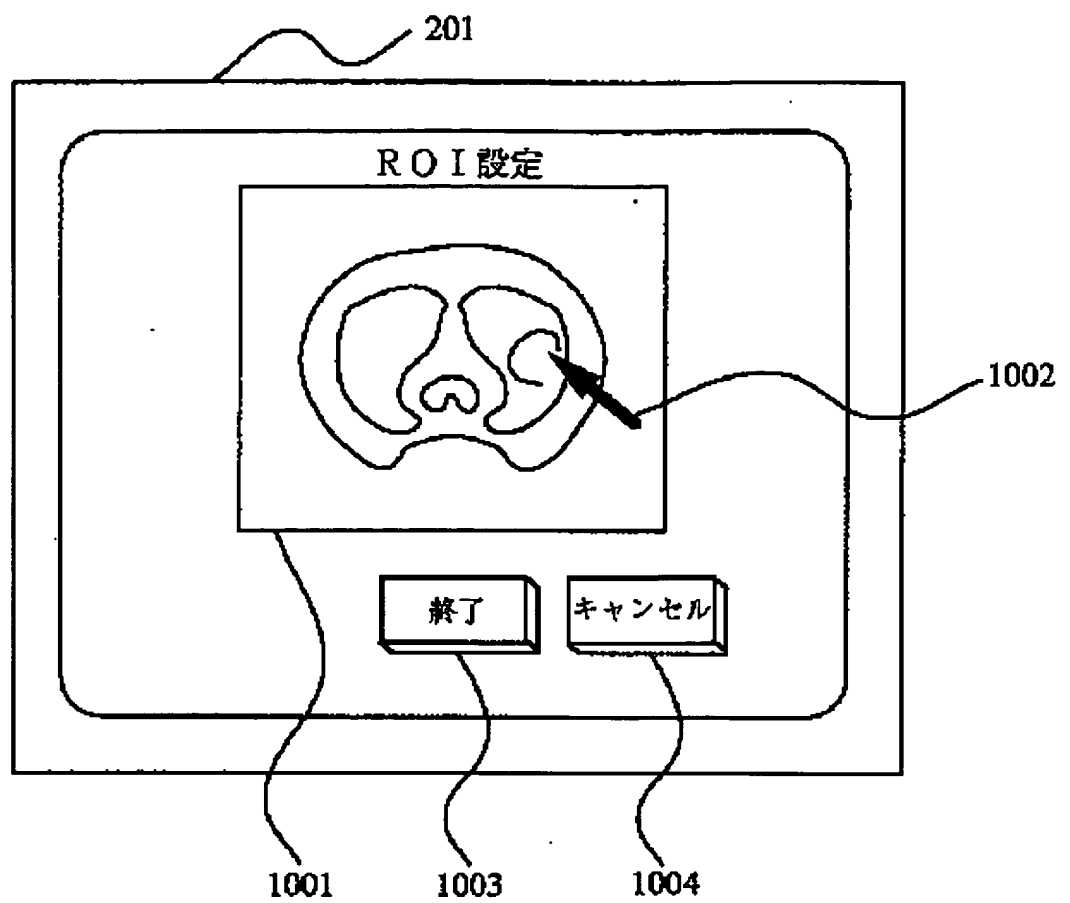












101

Patient Name :Hitachi Taro

Patient ID : 123456

No	study Date	Modality	Images
1	1996/05/20	CT	1
2	1996/05/20	CT	14
3	1996/05/20	CT	14

表示

キャンセル